REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-4, 6-10, 12-16, and 18 are currently pending. Claims 1, 6, 7, 12, 13, and 18 have been amended by the present amendment. The changes to the claims are supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, Claim 1 was objected to as containing an informality; Claims 6, 12, and 18 were rejected under 35 U.S.C. § 112, second paragraph, regarding various questions of antecedent basis; and Claims 1-4, 6-10, 12-16, and 18 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,680,812 to Iwashiro (hereinafter "the '812 patent").

Applicants respectfully submit that the objection to Claim 1 is rendered moot by the present amendment to Claim 1. Claim 1 has been amended to address the informality noted in the outstanding Office Action. Accordingly, the objection to Claim 1 is believed to have been overcome.

Applicants respectfully submit that the rejections of Claims 6, 12, and 18 are rendered moot by the present amendment to those claims.

Amended Claim 1 is directed to a simulation method for simulating a behavior of a mechanism of a mechanical device that is regulated by a mechanism control software, using a hybrid model of the mechanical device, the hybrid model including a state transition model and a continuous system model, the method comprising: (1) inputting hybrid model description data representing the hybrid model; (2) analyzing the hybrid model description data to extract first description data of the state transition model and second description data of the continuous system model, which is represented as simultaneous equations of ordinary differential equations and algebraic equations; (3) generating a table representing a

relationship between continuous system equations including the simultaneous equations and switching conditions thereof, based on the extracted first description data; (4) generating a plurality of internal data expressions of all the continuous system equations, based on the extracted second description data; (5) starting a simulation of the mechanism after completion of generating the table and generating the internal data expressions; (6) selecting an active continuous system equation by looking up the table according to an occurrence of an event; and (7) outputting data that represents the behavior of the mechanism by solving the selected active continuous system equation by numerical integration using the internal data expressions that corresponds to the selected active continuous system equation, wherein the outputted data is supplied to the mechanism control software as a response to a control signal provided from the mechanism control software. The changes to Claim 1 are supported by the originally filed specification and do not add new matter.[1]

Applicant respectfully submits that the rejection of Claim 1 (and dependent Claims 2-4) is rendered moot by the present amendment to Claim 1.

The '812 patent is directed to a head-positioning control system that includes a combination of a multi-rate control system and a single rate control system for controlling the head position of a disk drive head. See '812 patent, Figure 2. As shown in Figure 3, the '812 patent discloses that a seek control algorithm is initially used until the head has reached the desired track or its vicinity, and then the control algorithm is changed to track-following control thereafter. Further, the '812 patent discloses that the system can switch to a single-rate control upon the occurrence of a disturbance of the occurrence of saturation. Regarding single-rate control, the '812 patent further discloses that "time sequence data about the positions, speeds, and specific inputs (compensation values) serving as targets during sampling are tabulated. The single rate control system refers to the table in each control input

[1] See, e.g., page 6, lines 10-13 and page 16, lines 23-25 of the specification.

period, starting from the time when the seek operation of the head starts."[2] The '812 patent further states that the multi-rate control system also makes use of a similar table in each control input period.

However, Applicants respectfully submit that the '812 patent fails to disclose the step of inputting hybrid model description data representing the hybrid model, as recited in amended Claim 1. The '812 patent is silent regarding inputting a hybrid model (the hybrid model including a state transition model and a continuous system model), as recited in amended Claim 1.

Further, Applicants respectfully submit that the '812 patent fails to disclose analyzing the hybrid model description data to extract first description date of the state transition model and second description data of the continuous system model, which is represented as simultaneous equations of ordinary differential equations and algebraic equations, as recited in amended Claim 1. The '812 patent is silent regarding such a continuous system model.

Further, Applicants respectfully submit that the '812 patent fails to disclose the step of selecting an active continuous system equation by looking up a table according to an occurrence of an event, as recited in Claim 1. While the '812 patent discloses switching from seek control to track-following control (single rate control), as shown in Figure 3, this type of switching is different than the selecting step recited in Claim 1. The '812 patent does not disclose switching the '812 control modes by looking up in a table according to an occurrence of an event. The separate tables disclosed by the '812 patent are merely used within the separate control modes disclosed by the '812 patent.

Further, Applicants respectfully submit that the '812 patent fails to disclose the step of starting a simulation of the mechanism after completion of generating the table and generating the internal data expressions, as recited in Claim 1. In this regard, Applicants note

[2] '812 patent, column 7, lines 12-17.

that the Office Action relies on column 7, lines 25-30 and 54-58 as disclosing this limitation. However, Applicants note that lines 25-30 in column 7 of the '812 patent merely state that "...a concrete operation when the head positioning control system as applied to the head positioning control the disk drive will be explained by reference to a flowchart of Figure 3." Applicants respectfully submit that this is not a disclosure of starting a simulation of the mechanism. Rather, Figure 3 is merely a flowchart of the operation of the CPU when switching modes. This is not a simulation. Further, the passage in lines 54-58 of column 7 merely describes switching between the control modes, but does not describe a simulation of the mechanism, as required by Claim 1.

Further, Applicants note that the amended Claim 1 recites solving a selected active continuous system equation by numerical integration. Applicants respectfully submit that the '812 patent does not disclose numerical integration. In this regard, Applicants note that page 5 of the outstanding Office Action merely refers to column 6, line 20 to column 7, line 25 of the '812 patent. However, these lines do not disclose numerical integration. The word "integration" does not appear in the text of the '812 patent.

Thus, for the reasons stated above, Applicants respectfully submit that amended Claim 1 (and dependent Claims 2-4) patentably defines over the '812 patent.

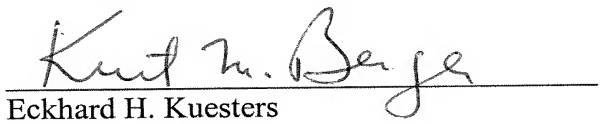
Amended Claims 6, 7, 12, 13, and 18 recite the continuous system model and the inputting of a hybrid model limitations recited in Claim 1. Accordingly, for the reasons stated above for the patentability of Claim 1, Applicants respectfully submit that the rejections of Claims 6, 7, 12, 13, and 18 (and all associated dependent claims) are rendered moot by the present amendment to the independent claims.

Thus, it is respectfully submitted that independent Claims 1, 6, 7, 12, 13, and 18 (and all associated dependent claims) patentably define over the '812 patent.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Eckhard H. Kuesters
Attorney of Record
Registration No. 28,870

Kurt M. Berger, Ph.D.
Registration No. 51,461

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 03/06)
KMB/rac
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